Sustainable Fort Carson

SUSTAINABLE FORT CARSON
RIGHT ACTIONS. RIGHT NOW!

2015 ANNUAL REPORT

Achieving Our Goals

Col. Joel D. Hamilton, garrison commander, commutes to and from work on his mountain bike.

Since the early 1980's Fort Carson has tried to reduce its environmental impact, ensure regulatory compliance and manage the public resources entrusted to us with a strong stewardship ethic. Continuing our longstanding effort to be good stewards, we set aggressive, long-term targets with community stakeholders in 2002. Since that time we have endeavored to be transparent, responsible and accountable for achieving these goals and for encouraging

local government, communities, institutions and organizations in the region to pursue similar initiatives.

In recognition of past and on-going efforts and our commitment to sustainability, the Army in 2011 selected Fort Carson to be one of two net zero pilot installations for energy, water and waste that accelerated the timeline for achieving all our initial goals from 2027 to 2020. We have implemented projects and initiatives within

TRIPLE NET 0

current budget constraints through commitment, determination and collaboration. Success by 2020 will require continued leadership, partnership and innovation.

We continually review and address our installation impact on a regular basis, measuring results against the goals we've set for ourselves. In 2015, we achieved a 24% reduction in energy use intensity (energy use per square foot) compared to 2003. We have also reduced water use by 66 percent compared to 2002, and diverted 50% of solid waste from landfills mainly through composting of dining facility waste and recycling of scrap metal, office, industrial and household waste.

I'd like to thank our Soldiers, employees, Family Members, suppliers, partners and community stakeholders who have contributed to our success and our continued progress. I hope you will find our 2015 report informative as we strive to be transparent and accountable to the citizens of the region and the US Army. We welcome your feedback on how we are doing and how we can improve our sustainability journey.

Joel D. Hamilton
Colonel, U.S. Army
Garrison Commander

Progress at a Glance

- Energy and Water
- Transportation
- Development
- Air Quality
- Procurement
- Zero Waste
- Training Lands

- Success in achieving a goal or successful movement along a predetermined timeline within a goal plan
- Positive movement toward goal objective or timeline is quantifiable, but not yet achieved.
- Significant impediments to goal objective or timeline exists. Future success in jeopardy.

"Sustainable Fort Carson—Enduring G.E.M. of the West!"*

G=Green
E=Environment and Economy
M=Model

*From: 2002 Sustainability Charter

2015 Accomplishments

- Reduced our energy use per square foot by 24% compared to 2003
- Reduced our drinking water use by about 66% compared to 2002
- Added high performance buildings to the facility inventory with 82 total
- Diverted 50% of solid waste away from Landfills
- Reduced the percentage of personnel commuting alone from 94% to 88%

Inside this report:

Sustainable Fort Carson

A **Net Zero Energy** Installation reduces overall energy use; maximizes efficiency, energy recovery, and cogeneration opportunities; and offsets the remaining energy demand with the production of renewable energy.

Energy Intensity Down
(Compared to 2003 baseline)

Exterior LED

Energy Efficiency and Renewable Energy

Energy efficiency is the first priority. Since 2003, we have reduced our energy use per square foot (SF) or energy intensity by 24% while increasing square footage by almost 6,000,000 SF. We plan to implement projects and activities to achieve a 50% reduction by 2020.

2015 Energy Efficiency Efforts and Renewable Projects

- Inside and outside lighting retrofits in 72 buildings
- Replaced 38 motors and variable frequency drives
- Installed dry coolers in four buildings for more efficient cooling

We intend that 100% of our energy requirements will be from renewable sources, preferably by generating all of our energy (power and heat) onsite over the course of a year so that we achieve "net zero".

- 4% of electricity generated from photovoltaic (solar) energy systems on site
- 6% from wind power
- About 1.5% of thermal or heat energy (ground source heat, solar hot water, solar walls)

Fort Carson received a 2015 Federal Energy and Water Management Award and a 2015 Secretary of the Army Energy and Water Management Award in the energy efficiency/energy management category.

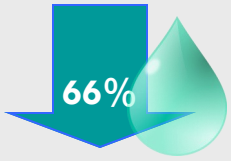
Net Zero Water

The Net Zero water strategy balances water availability and use to preserve a sustainable water supply for years to come.

Water Efficiency and Reuse

Since 2002 we have reduced our water use per square foot (water intensity) by 66% through improved efficiency and conservation. Since we have achieved our 2020 water intensity reduction target (50% by 2020), we will now pursue a 75% target.

Water Intensity Down



Compared to 2002 baseline

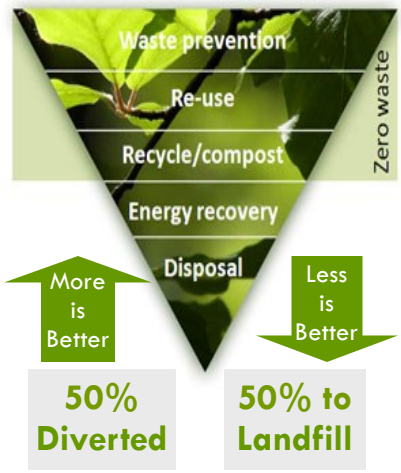
Water Efficiency Projects

- Over 2700 tub diverters wasting on average 0.5 gallons per minutes replaced
- Additional water fixtures replaced in 200 buildings (toilets, urinals, showerheads)

Water Reuse Projects

- Continued to expand the reclaimed water irrigation system for large turf areas

Storage for reclaimed water at Cheyenne Shadows Golf Course



Zero Waste

Reused or recycled 88% of items processed through the hazardous waste facility (6093 lbs to landfill)

The **Net Zero Waste** hierarchy consists of preventing and reducing, reusing, repurposing, recycling, composting and recovering energy, with disposal being non-existent.

Waste Prevention and Reduction

Preventing and reducing waste must be our first priority, but remains the most difficult to address. Purchasing behaviors, product packaging and convenience items continue to challenge zero waste goal success.

Waste Diversion

- Collected grass clippings and tree trimmings, dining facility food waste and biosolids from sewage treatment for composting at a local landfill
- Diverted/Recycled separated and single stream office and household materials; batteries; florescent bulbs; mattresses; paint; automotive products; electronics; scrap metal; porcelain; construction and demolition waste and wood pallets
- Donated reusable furniture to charitable organizations

Sustainable Fort Carson

Sustainable Procurement

Purchasing goes hand in hand with zero waste. Optimally, we consider the entire "lifecycle" of a product or service when making procurement decisions.

Recycled Content & Biobased

- 100% post-consumer recycled content print/copy paper preferred and paper use reduction encouraged
- Items such as plant-derived cleaning and food service ware required or encouraged

Energy & Water Efficiency

- Appliances met strict energy efficiency standards
- LED technology used for outdoor and indoor lighting
- No or low water using fixtures used in new construction and renovations

Bioretention area or rain garden

- Drought-tolerant, native plants and stormwater runoff used in landscapes

Awareness and Education

- All government purchase card holders trained on "green" procurement
- Green procurement training and sustainable products and services demonstrated at sustainability expo on post

"Product Lifecycle" means the energy, water, raw materials, infrastructure, labor and other resources needed to assemble or manufacture a product, and the resources used to package, distribute, store, use and properly handle the product at the end of its useful life.

Sustainable Development

Development affects all other sustainability goals. We strive to achieve three main objectives for this goal.

Completed in 2015, Evans Army Community Hospital (EACH) Renovation attained LEED Silver in the Commercial Interiors v3.0 system

High Performance Buildings

- Over 80 high performance buildings including three certified US Green Building Council Leadership in Energy and Environmental Design (LEED) Platinum facilities constructed since 2006

Walkability

- Land use vision plan completed incorporating sustainable development principles that will guide current and future development of Fort Carson
- Pathways created and maintained to improve walkability, bikability and promote active living

Watershed Health

- Non-exempt projects greater than 5000 square feet included regional stormwater detention or on-site controls such as grass swales matching the predevelopment hydrology of the site

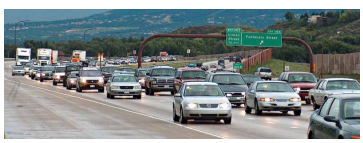
FORT CARSON HAS 82 LEADERSHIP IN ENERGY AND ENVIRONMENTAL DESIGN (LEED) CERTIFIED NEW BUILDINGS SINCE 2006:
-40 SILVER
-39 GOLD
-3 PLATINUM.

New construction of a 41,520 square foot LEED Platinum certified building completed in 2015

Sustainable Transportation

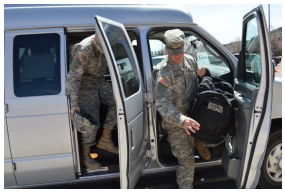
Land use development patterns and a 'car culture' continue to challenge achieving this goal.

Strategies to reduce single occupancy vehicle (SOV) commuting included continuing a free post shuttle and investing in infrastructure and incentives to encourage walking, bicycling, ride sharing, mass transit and other modes of travel. Temporarily changing physical training from early morning to the afternoon may have also enabled more ride sharing and reduced SOV commuting.



About 88% of Fort Carson commuters drove alone to and from post in 2015, down from 94% in 2012

Our transportation goal also includes strategies to reduce petroleum use, increase sustainable, alternative fuel use and improve the average fuel economy (i.e. mpg) of the non-tactical fleet. About 70% of administrative vehicles were either flex-fuel (uses both gasoline or E85) or hybrid electric in 2015.



Free post shuttles circulate the built up area of Fort Carson and averaged over 10,000 riders per month in 2015

Sustainable Fort Carson

Training Lands and Ranges

270 adult gall wasps (Aulacidea acroptilonica) were released for biological control of Russian Knapweed, an invasive plant species found both at FC and the PCMS

We must be good stewards of the land in order to sustain military training now and in the future. We manage over 374,000 acres of training lands and ranges comprising Fort Carson and the Pinon Canyon Maneuver Site (PCMS).

Low water crossings reduce sedimentation and improve safety

Land Conservation and Natural Resource projects completed:

- 168 acres of noxious weeds treated
- 900 plots inventoried for forestry
- 3750 acres intentionally burned to reduce wildfire hazards

Cultural Resource activities:

- Started acquiring large boulders for placement around sensitive archeological sites
- Completed all cultural resources survey of numbered training areas at PCMS
- Completed baseline monitoring of all Fort Carson archeological sites and 150 at PCMS

Land rehabilitation work at PCMS

"...CLIMATE CHANGE IS AN URGENT AND GROWING THREAT TO OUR NATIONAL SECURITY, CONTRIBUTING TO INCREASED NATURAL DISASTERS, REFUGEE FLOWS, AND CONFLICTS OVER BASIC RESOURCES SUCH AS FOOD AND WATER."
- NATIONAL SECURITY IMPLICATIONS OF CLIMATE-RELATED RISKS AND A CHANGING CLIMATE, JUL 2015

Air Quality

Actions we take to reduce energy and water use, to improve the efficiency of land development, buildings, and transportation systems, to buy green products and to reduce waste all contribute to less greenhouse gases (GHG), hazardous and other air pollutants.

We continued to strive to meet our target for reducing greenhouse gases in 2015 by continuing to replace older, less efficient equipment with newer cleaner burning models. We also continued to review Material Safety Data Sheets (MSDS) to ensure products with lower volatile and hazardous air pollutant (HAP) ingredients for operations and maintenance when possible. These and other measures led to decreasing air emissions from Fort Carson.

Projects

- New, energy efficient buildings constructed
- Energy retrofits completed
- Low emission heating and cooling systems installed

Solar wall improves heating system efficiency

Awareness, Conservation & Behavior Change

Pollution Prevention Week paper shredding & packing foam collection event, Sep 2015

Awareness, dialog and outreach lead to conservation, behavior change and community support of initiatives.

Soldiers, Employees, Tenants & Contractors

- Incoming Soldiers (about 9000) briefed on environmental compliance and sustainability
- Facility Manager (FM) program refined by updating standard operating procedures, providing semi-annual training, performing courtesy net zero audits and improving FM recordkeeping
- Unit net zero contest initiated to focus efforts and buy-in

Community Involvement

- Activities with school children, teachers and parents
- Helping local communities with projects and initiatives
- Planning and collaboration with local agencies, institutions and organizations

Soldiers aid in burn scar restoration

Challenges Provide Opportunities

Low utility rates make return on investment for on-site renewable energy sources less favorable for development

Renewable energy for purchase or transmission through local utility provider limited

Water rights law makes grey water, reclaimed wastewater and untreated water use problematic, but not impossible

Car-oriented community development patterns do not favor alternative means of transportation

Use of sustainable, alternate fuel limited by infrastructure, vehicle availability and cost

Occupants, operators and maintenance workers must learn about and interact differently with LEED buildings

Low impact development reduces downstream stormwater impacts; changes landscape maintenance

Many requestors and purchasing mechanisms; choosing "greener" products and services from mandatory sources can be confusing

Single stream recycling improves rate, but lowers income for operations; waste-to-energy may be a viable alternative for zero waste

Changing climate and weather impacts infrastructure, health and natural resource condition

Resource constraints and unpredictability inhibit investments in sustainability, but may stimulate innovation

Essential partnerships like all relationships require time, effort and nurturing

The future of mobility—driverless and hydrogen fuel cell electric vehicles?

People Who Make a Difference Every Day

We'd like to say thank you to the following individuals and organizations who make the vision of a Sustainable Fort Carson and best 'Pikes Peak Region' a possibility.

Fort Carson

- CPT Walter Peeples, 4th Brigade Support Battalion, 1st Stryker Brigade Combat Team
- 1LT Adam Leemans, 52nd Brigade Engineer Battalion, 2nd Infantry Brigade Combat Team
- Ms Janine Hegeman, Stormwater Program Contractor, Environmental Division, Directorate of Public Works

Janine Hegeman demonstrating a watershed during Fort Carson Earth Day

Community

Many support Sustainable Fort Carson by directly assisting us as we conduct our work or by promoting and taking steps towards sustainability in their own businesses, organizations, institutions and communities.

Hearty thanks to the participants in the monthly Sustainability in Progress (SIP) events and the many others too numerous to mention who practice sustainability every day!

"ALONE WE CAN DO SO LITTLE; TOGETHER WE CAN DO SO MUCH." - Helen Keller

Community members enjoy monthly presentations and discuss next steps towards regional sustainability

How You Can Help

"The biggest threat to our planet is the belief that someone else will save it."—Robert Swan

Small actions make a difference. Small actions may not change the world, but they will make it better!

You Can

- Turn out the lights
- Turn down the heat
- Turn air conditioning off/up
- Plant native trees, shrubs and wildflowers
- Put in a rain garden
- Walk, bike, take the bus
- Give a buddy a ride
- Drive an electric or alternative fuel vehicle
- Buy recycled content and plant-based products
- Grow your own food
- Buy food produced by local farmers and ranchers
- Eliminate single use plastic in your life
- Reuse, recycle and compost
- Donate lightly used items
- Get involved
- Be a change agent!

Fresh, locally sourced food tastes better, contains more nutrients, benefits the environment, and supports local producers and the economy

Sustainable Fort Carson

2015 Annual Report

SUSTAINABLE FORT CARSON
RIGHT ACTIONS. RIGHT NOW!

US Army Fort Carson
1626 Ellis Street
Fort Carson, CO 80913

Phone: 719-526-4648

mary.j.barber.civ@mail.mil

LIKE US ON facebook
http://facebook.com/sustainablemountainpost

Even though progress towards a Sustainable Fort Carson sometimes seems excruciatingly slow and personally frustrating to me (we need to do more, better, faster), I recognize a culture of sustainability continues to grow across all aspects of our installation and many in our region look to Fort Carson as a sustainability leader. I am humbled and honored by this, and I want to thank each and every one of you who have supported me and Fort Carson over the years.

As a member of the defense community who is integral to the broader Pikes Peak region and who trains sons and daughters to defend our freedoms, the principle of "right actions, right now" guides us on our sustainability journey. We strive every day to reduce our "bootprint" and make Fort Carson and surrounding communities a better place to live, work, and play.

The progress we have made would not have been possible without innovation, community partners and dedicated individuals and teams committed to making progress. We hope that you will join us on our quest to Sustainable Fort Carson and to a resilient, sustainable Pikes Peak region.

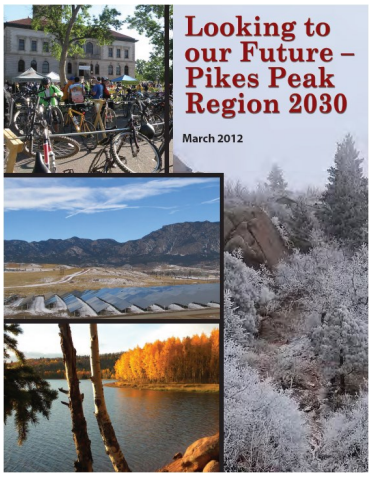
Mary J. Barber, Installation Sustainability Resource Officer

Solar Ready Vets initiative trained Service members how to install solar panels, connect to the grid, and comply with building codes

Fort Carson Family Homes, our privatized housing partner, began installing solar on homes in 2015

By the end of spring 2015, more than 180 Cliff swallows, federally protected migratory birds, used a nesting structure and "amenities" created for them at the PCMS

"Looking to Our Future: Pikes Peak Region 2030"



- Agriculturalists provide a high percentage of safe, quality food for the region and agricultural land and water preserved
- Arts and culture contribute to social and economic vitality of the region
- Built and natural environment complement one another and enhance the lives of people, promoting community, culture and commerce, and preserving and protecting the natural environment
- Strong and diverse economy that supports and benefits from sustainability
- Comprehensive, affordable and life-long educational opportunities available to all
- Considerable progress made towards 100% sustainable energy usage
- Healthy, long-lived population with a good quality of life
- Significant progress toward a net zero waste future
- Sustainable, equitable and affordable multi-modal transportation system
- Water use efficient and met by currently-owned water supply

(adapted from "Looking to Our Future: Pikes Peak Region 2030, Mar 2012)

Check out sustainability happenings in our region at http://peakalliance.co.